CAPCOM And that's about all our news, how about your news.

SC well, we're looking forward to a big burn here shortly.

CAPCOM Rog.

SC Mike, I think I can say it without contradiction it's been a mighty long dry spell up here.

CAPCOM I guess you can say anything you like without contradiction.

SC When do we dump water, Houston.

CAPCOM Say again, Frank.

SC When do we dump water.

CAPCOM Stand by. - Apollo 8, Houston.

SC Go ahead, Houston.

CAPCOM We will get you the number after a while on your water dump. Looks like the quantity isn't increasing very slightly and we're considering not only the quantity in regard to the dump, but also its effects on the trajectory relative to TEI and so forth, but we will have a good answer for you shortly.

SC We are not just thinking about the waste water tank, we're thinking about some other kind of water that has to get dumped out of the spacecraft. Slightly used water.

CAPCOM Rog. We understand. - Apollo 8, Houston.

SC Go ahead.

CAPCOM Roger, we have about three and a half minutes to LOS, we give you back the DSE for your control and in regard to your water dump, we are tentatively predicting a waste water tank dump at about 80 GET and any other dumps are your discretion, any time you would like to make them.

SC Thank you.

CAPCOM People listening to the high bit rate down here, say it's like sitting in your living room listening to good hi-fi.

SC Sounds like a good idea.

CAPCOM Apollo 8, Houston, coming up on two minutes to LOS, we got a good reservice on the primary evaporator and everything is still looking very good down here.

SC Okay, thank you.

PAO This is Apollo control, Houston, 76 hours 58 minutes the spacecraft will lose lock with Earth in about one minute and start its fifth - actually its sixth trip behind the Moon and it will be the start of its sixth rev and when it gets to zero, Mike Collins has reminded the crew one minute to LOS and Frank says loud and clear, "loud and clear", they will say their good-byes on, you heard nothing much from Bill Anders on this pass and you are not likely

APOLLO 8 MISSION COMMENTARY, 12/24/68, GET765130, 1152a, 248/2

PAO to for several more, he is an extremely busy photography. His column in the flight plan is almost solid with instructions, he is moving from one couch to another, he is using several kinds of cameras, changing lens, and he is as busy as one man - one astronaut could be. Jim Lovell is working down at the G and N station, getting pointing data and the command pilot in addition to flying the spacecraft, having lunch, is been carrying on a running conversation with his compatriot, Mike Collins down here on the Earth. We have lost lock, we should be back with the crew in 44 minutes. This is Apollo control at 77 hours into the flight.

END OF TAPE

PAO This is Apollo Control Houston, 77 hours 32 minutes into the flight. All quiet for approximately 20 minutes. We are due to acquire again in about 13 minutes. One of the more interesting system phenomena, I guess we could call it, to come out of these early revolutions around the moon is the temperature variance we are seeing within the environmental control system. The system is proving capable to the task, but it seeing much wider excursions that it sees in earth orbital flight. I'm talking about temperatures on the variances - excursions, I guess is the proper word, of 40 to 50 degrees within the system. That is not in the cabin, of 40 to 50 degrees, whereas at the same point in earth orbital flight between the light and dark side, might see an excursion on the order of 10 to 15 degrees. Again, the environmental control system is handling the cabin very nicely, it's been purposely set up somewhat than warmer than yesterday and previous days the crew prefers the cabin up in the higher 70's and that is where it has been on consistently today, 77 to 79. but again and again, we hear action on the water boiler as we come around from the dark side into the sun side. This phenomena I'm sure, will be examined at more length at the change of shift briefing, and as the flight progresses. No new conversation report, all is well at 77 hours 34 minutes into the flight.

END OF TAPE

PAO This is Apollo control, Houston, 77 hours 49 minutes into the flight and just three minutes ago we acquired Apollo 8 as it came around the corner on this fifth revolution around the Moon, here is the conversation as it progresses.

CAPCOM Apollo 8 this is Houston, over.

SC Apollo 8, go ahead.

CAPCOM Roger, read you loud and clear. Welcome back.

SC Roger. Looks like the evaporator - looks like the evaporator is holding okay or at least it is trying to. It dropped the temperature down to about 32 and now it's come back up again and stabilized at about 42 degrees.

CAPCOM Roger, copy, Bill.

SC Roger, Houston, Apollo 8.

CAPCOM Apollo 8, Houston.

SC Roger, Houston, this is Apollo 8, what we are doing - the control point tracking I managed to look for a CP1 at the same time we were trying to do a CP2 on this rev. I picked two marks which are just as small, but more easily recognizable, then the ones that were given to me. I know that I can repeat the process and pick the same small point on the next rev. Now I can try to look for the control points that are written down, but I think that I have better control over the ones that we have.

CAPCOM Roger, Jim understand, we accept that way.

SC Roger, one more point, the control point times which you have given me are a little bit off and I can notice by comparing these maps that these maps are not too well aligned either.

CAPCOM Roger, these two small points that you can repeat the marks on will you be able to identify those precisely on a map, over.

SC That's affirmative, that is why I picked them, they are both - they are both very prominent features and they are both very small craters about the same size as the one we are looking for, but I can pin point them on a map.

CAPCOM Roger.

SC Houston, Apollo 8.

CAPCOM Apollo 8, Houston, over.

SC Roger, one more comment, this is over a lot of controversy of data priority meanings, it looks like 10 degrees pitch up is the best attitude to obtain a rise so that you can follow the land mark down through the scanning telescope. If you pitch down any more full up trudging will not get the horizon and the horizon is a great help in leading yourself into the control plan.

CAPCOM Apollo 8, Houston.

SC Go ahead.

CAPCOM Jim we concur with your use of the two small craters which you can repeatableymark on and find on the map and also if you will give us your new latitudes and longitudes we can compute for you a time of closest approach to those points with the spacecraft 10 degrees pitched up, over.

SC Roger, Houston, CP1 latitude minus 6062 69 longitude over 2 minus 78954 altitude plus 00152; for CP2 latitude minus 09638 longitude over 2 plus 81691 altitude minus 00007. I tried to get these things read at this last pass, but I let it go by to get set up for this first track of the landing site.

CAPCOM Roger, on CP1 would you say again the latitude and on CP2 say again the longitude on the two please.

SC Roger, CP1 latitude minus 06269, that is the latitude and for longitude over 2 for CP2 plus 81691.

CAPCOM Okay, we copied them, thank you.

SC And it appears that the resolve medium is a very good combination to track.

CAPCOM Roger, I understand, resolve medium.

SC And it appears so far, Houston, that no spacecraft motion is required to get 5 marks on the target in plenty of time.

CAPCOM Roger, I understand you require no spacecraft motion to get 5 marks.

PAO And that brings us up to this point, we have had no additional comments now, for a half a minute or so, that is excellent data to have, precisely the kind of data that we had hoped to get. The navigational side of lunar orbit which will be flown by both the command - future command module and LM flights around the Moon. Lovell will continue to - his navigational work and dear old Bill Anders sitting off in one corner there squeezing off pictures that the most professional photographers wouldn't believe. Frank Borman is entering a rest period here, which is to extend of three hours. It is doubtful that he will really go to sleep, but he has been excellent about following flight plan today, he probably needs rest. At 77 hours 57 minutes into the flight this is Apollo control, Houston.

END OF TAPE

PAO Apollo Control in Houston here, 78 hours 19 minutes into the flight. We've had a few sporadic conversations with two very hard working pilots, actually I guess all the conversation has been with one, Jim Lovell, in the last few minutes. Here is a collection of those conversations.

CAPCOM Apollo 8, Houston.

SC Go ahead.

CAPCOM Roger. I am about 15 minutes early with the TEI fix update and the map update. I will have them here whenever it's convenient for you to copy.

SC Okay, just a minute, Mike.

CAPCOM Apollo 8, Houston.

SC Go ahead.

CAPCOM Roger. We would like to ask you to stop using auto optics on the pseudo-landing site. It's necessary that we send you up a P-27 to update the RLS values stored in the computer, over.

SC Roger. I found -- list of ... objects, D-1.

CAPCOM Roger, understand.

CAPCOM Apollo 8, Houston, over.

SC Go ahead, Houston.

CAPCOM Roger. It you would go to POO in ACCEPT please, we are going to send you a P-27 load which will update an RLS value which will be followed by a procedural change, Jim, we will give you later and auto optics should be working shortly.

SC Roger. All right, just use no landmark auto optics instead of the code.

CAPCOM Apollo 8, Houston. We are also sending you a state vector update at the same time.

SC Okay, we will be expecting that.

CAPCOM Apollo 8, Houston. We taking the DSE for a dump. Over.

CAPCOM Apollo 8, Houston, over.

SC Go ahead, Houston.

CAPCOM Roger. We would like to take Bill's DSE for a dump. Over.

SC Roger, go ahead.

CAPCOM Thank you.

PAO And that brings us up to snuff with all the tape of this pass. I think we are going to go back to live action, let's cut up there.

PAO Our orbit this rev 60 - shows a 62 mile apogee and a 60.1 mile perigee, perigee occurring at 10 degrees

south by 101 degrees east and apogee occurring at 10 degress north by 78 west. Here goes a call.

CAPCOM Apollo 8, Houston. Roger. I have updates, a map update for rev 5/6, and TEI fix update. Which would you like first?

SC Okay, I've got the map update page now, why don't you give me that one.

CAPCOM Okay, map update for rev 5/6. LOS 785849, sunrise 790807, prime meridian 791430, AOS 794436, sunset 802105, IP 1, time of closest approach to target B1 800908. Now your two new control points that Jim gave us, control point number 1, acquisition 791032, control point number 2 acquisition 792314, over.

SC Roger, copy. Ready for the TEI.

CAPCOM Okay, Bill. Before we read the big TEI update here, I'd like to give Jim briefly a procedure for P-22. When he comes to NOUN 89, we request that he do a VERB 34 enter, do not proceed, and by so doing that, he will not incorporate the lat and longitude from his mark and he will not change the reference value of the landing site, and we will solve auto optics problem, over.

SC Let me see if I have this correct, Mike. When flashing 0689 comes up with the latitude and longitude information, I will not proceed but will go to VERB 34 and terminate, is that correct?

CAPCOM Yes, that is affirmative. Do a VERB 34, enter instead of proceed. And that will -

SC All right, is this technique true?

SC Houston, is this technique true for both the node control point auto optics on G-25?

CAPCOM Stand by one, Jim.

SC And the --

CAPCOM That is affirmative, Apollo 8, that is always true.

SC Okay, roger. True for the code auto optics and no landmark. I'll see that it goes on - or I'll use 34 instead procedural ....

CAPCOM Roger, thank you, Jim and I have the TEI 6 hour, when you are ready, TEI number 6.

SC Go ahead.

SC Ready to copy.

CAPCOM Roger. I'm glad you are ready to copy TEI number 6. I've got one last comment for Jim before you do so. The VERB 89, correction, the NOUN 89 we are talking about is the one that he gets after marking it. There are two NOUN 89's, one prior to marking and one after and our

procedure references NOUN 89 after marking, over.

SC Roger, understand.

CAPCOM Thank you, and Bill, are you still ready to copy?

SC Ready to copy, Mike.

CAPCOM TEI 6, SPS/G&N, 45701 - 040 + 157. Are you with me so far?

SC Roger.

CAPCOM 081 21 24 43 + 31776 - 00823 - 01365 180 016001 not applicable + 00188. Are you still with me? Over.

SC Roger.

CAPCOM Good. 31816302 31624 40 2699 396033 down 054 left 21 + 0810 - 1650 --

END OF TAPE

CAPCOM plus 0810 minus 1650012 niner 68362221464204. GDC align remains the same, Sirus and Rigel. Roll 12 niner, pitch 155, yaw 010, ullage 4 quads for 15 seconds. Horizon on 6 degree line at TIG minus 3 minutes, over.

SC Roger, Houston, TEI 6 SPS/G and N, 45701 minus 040 plus 157018212443 plus 31776 minus 00823 minus 01365180016001 NA plus 001883181630231624402 6 niner, niner. Are you with me?

CAPCOM Yes, I'm with you.

SC 3 niner 6033, down 054, left 21 plus 0810 minus 1650012 niner 68362221464204. Same GDC align Sirius and Rigel 12 niner 155010, 4 jet, 15 seconds. Horizon 6 degrees, TIG minus 3, over.

CAPCOM Roger, Bill. On your ignition time, GETI is 81 hours, 081 over.

SC Roger, got it, 081.

CAPCOM Thank you sir.

SC Thank you. As a matter of interest, these side windows are so hazy, that when the sun shines on them, they just about - they are real poor for any visual observation or photography heads up.

CAPCOM Roger, understand.

CAPCOM Apollo 8, Houston, over.

SC Go ahead, Houston.

CAPCOM Roger, these last state vector updates we sent you, Jim, was to the LM slots and you will have to transfer that over to the CSM slots using (garble) 47 enter, over.

SC Roger, will do.

CAPCOM Thank you.

CAPCOM Apollo 8, Houston.

SC Go ahead, Houston.

CAPCOM Roger, Bill has got his tape recorder back and we noticed that during that last dump, it was all in low-bit rate and we wondered if that was intentional or not? Over.

SC Roger, we didn't have much to say, we couldn't see out of the windows very well, Mike.

CAPCOM Roger, understand. Thank you Bill.

SC It was really too bad.

PAO This is Apollo Control Houston here, and that is a pretty tired Jim Lovell we're hearing, I take it, from somebody who has listened to him now for some 18 - 14 and 4 and 3 - 21 days. Here is somemore conversation, I think he is just about to get a GO for Rev 6.

CAPCOM Roger, Bill. This next time around into the sunlight, we don't expect problem with the primary evaporator. If it does start drying out, we think it is best just to close the back-pressure valve and there is no need to activate the secondary boiler, over.

SC Okay, I guess the 60 degree limit will still hold then.
CAPCOM Standby.

END OF TAPE

CAPCOM Apollo 8, Houston. We are suggesting you disregard the 60 degree limit and let it go ahead and rise up above 60. There is no need to activate the secondary, over.

SC Okay. We just don't want to boil our ?
....

CAPCOM (laughter) Roger, understand. Apollo 8, you are GO for the next lunar orbit rev.

SC Roger, Houston.

SC Roger, Houston. I'll read the book this time.

CAPCOM All right.

PAO This is Apollo Control here. We are 15 minutes to loss of signal, we will take the line down and bring you any additional comments that may occur between now and loss of signal. This is Apollo Control Houston at 78 hours 43 minutes.

END OF TAPE

PAO This is Apollo Control Houston, 79 hours even into the flight of Apollo 8. We have a few straineous comments coming up - as we went over the hill on this fifth rev, and we will play those for you now, right through loss of signal.

CAPCOM Apollo 8, Houston, over.

SC Go ahead.

CAPCOM Roger, we have about 4-1/2 minutes left before we have LOS, and we would like your last PRD readout. Over.

SC Standby. The commander is asleep, we'll get his when he wakes up. The LMP is still pitch, pardon the expression, quite safe onboard. C is 9, C and D is .09.

CAPCOM Roger, copy .64, .09, thank you.

CAPCOM Apollo 8, Houston, about 40 seconds to LOS and everything is looking good down here.

SC Roger, Houston. We will give it another try here.

CAPCOM Roger.

END OF TAPE

APOLLO 8 MISSION COMMENTARY, 12/24/68, GET 7946, 238p, 255/1

PAO This is Apollo control, Houston, 79 hours 46 minutes into the flight. Mike Collins has sent up two calls and has gotten no response, we think we have some key action, but that's all. To date we've, on the basis of earlier revs, we've gotten used to now, turning to our E-com and asking the first question as we come around the corner - how is the evaporator and the answer is this time it is working great. They apparently have the right handle on it. As I mentioned earlier, it is seeing large temperature excursions, apparently no larger than people within the project office and at North American and, I'm sure at the air corporation, had felt they might see. And I know many people in those positions who are very much relieved to see these excursions and all - excursions of only 40 to 50 degrees. It still no answer, no additional calls or anything. Mike Collins tries again. And we might have a ground antenna problem. Checking our ground stations now. In this temperature area the evaporator, of course, isn't the only area seeing the same order of temperature excursions I am looking at a command service module RCS summary here, which shows - prevents temperature readings at four or five points, on various tanks surfaces in the service module and see one valve in the temperature here which is a specific six digit identified point which marries the low and the high over any given rev and they happen to range from 50 degree fahrenheit to 100 degrees fahrenheit, there are four other readings in the service module, which range from 50 to 90 degrees fahrenheit. It's been nearly six minutes now since we acquired and just getting a general back ground noise in orbit. No additional attempts to raise the spacecraft. So based on what E-comm says, we may wait a few minutes before trying additional calls, we will be back up then. It is 79 hours 51 minutes into the flight, this is Apollo control, Houston.

END OF TAPE

PAO Apollo Control Houston here. We are locked up and Jim Lovell is giving us some interesting description of his use of the auto optics in his tracking tasks on the back side of the moon. Here it is.

CAPCOM Apollo 8, this is Houston, over.

SC Houston, Apollo 8, over.

CAPCOM Reading you very weak but - a lot of background noise. Welcome back around. How do you read now?

SC ...

CAPCOM Okay.

SC Houston, Apollo 8.

CAPCOM Apollo 8, Houston. Go ahead.

SC Roger, Houston. A few words about our optics tracking system. I used auto optics for control points 1 and 2 on the back side and they worked beautifully. Frank pulled the target for me and I went to the control point 3 as designated in our orbital control book, just using the latitude and longitude given to me and used auto optics to track that particular coordinate system but it was very close to the actual tracking spot. I think the mark there where I did my final marking is gives us important latitude and longitude. I'm now about to come up on the landing site and using auto optics --

PAO Apollo Control here. In this lull, we perhaps should take advantage at least to point to the people in the news rooms, who may not - have not noticed it yet. Our latest data display on one of our walls, there's the words Merry Christmas Apollo 8. The Merry is in red letters, the Christmas is in white letters, and the Apollo 8 is in blue letters. That display went up about an hour ago. I guess it technically should be called data. The consensus here is of course, that the crew is and remains quite busy and we are going to have some updates in the course of this pass, the sixth rev. Here it is.

SC Go ahead.

CAPCOM Roger. We know you're busy so we are not going to bother you. We are watching your progress on the DSKY. You are looking good, all your systems are looking good and we have maneuver pads for you any time at your convenience.

SC Roger, we will take them when we are doing the P-52, if that's okay.

CAPCOM That is just fine.

PAO And this is Apollo Control Houston at

APOLLO 8 MISSION COMMENTARY, 12/24/68, GET 795600, CST 2:45p 256/2

80 hours 1 minute into the flight. We apparently are not going to have very much communication at this point. We will come back up when we do. This is Apollo Control Houston.

END OF TAPE

APOLLO 8 MISSION COMMENTARY, 12/24/68, GET 801512, CST 3:05p, 257/1

PAO This is Apollo Control Houston, 80 hours 15 minutes into the flight. In the last few minutes we recorded some most enthusiastic comments from Jim Lovell on his assignment. Comments from Lovell and from Anders on their tracking assignment during these middle revs around the moon. Lovell pays astronaut Jack Schmidt, Harrison Schmidt, actually, a PHD in Geology, a great compliment with the work that he and other members of the Lunar Mapping Science Laboratory here in MSC has done. In picking various Moon marks or land marks leading to the sights we've picked out as probable landing sights for subsequent Lunar missions. Jim, as I say, is most enthusiastic about the cloudy of the ridges and rills that he was given to work with, and Anders chimes in that he thinks it's all great, too, except he wishes the windows were more easily seen through. Here is the conversation we have - that's been going on in the last few minutes.

SC Mike, Apollo 8.

CAPCOM Apollo 8, go ahead.

SC Mike, there are an awful lot of objects down on the landing sight. It's just as formidible Jack Schmidt marked. All of the objects are tracking perfectly on the target, and if you'd like we can get it out beautifully. I have a beautiful view of it. The first I've seen just barely beneath the vertical now, and the second one coming up - just a grand view.

CAPCOM Roger, go ahead, Jim, Jack's listening.

SC Jack, the information - the triangles that we see now are from the first IV, second IV and the C1 are just right, I think, for landing conditions. The shadows aren't too deep for you to get confused, the land has texture to it and enough shadows there should make everything stand out.

SC If Jack's listening, tell him that the optical may be doing all right, but the eyeball is having a little trouble looking through all this smear on the windows.

SC Doing better than the eyeballs, how about the cameras?

SC We have the smme smear to look through. The Rendevous windows are okay, but there's some (garble) in all directions here so far.

CAPCOM Roger.

SC I think the vertical stereo will be okay.

SC It certainly looks like we picked a a more interesting place on the moon to land in. The back side looks like a sand pile my kids have been playing in for a long time. It's all beat up, no definition. Just a lot of bumps and holes.

SC I'm looking 2P2 right now, Houston, and

SC it's a great spot.
SC The area we're over right now gives some hint possible volcanic though I can't eyeball it at the moment to pin that down. There are some craters and build-ups that just definitely suggest volcanic activity.
CAPCOM Rog. I understand Bill, and I understand Jim thinks the old 2P2 is the winner.
SC Yeah, that's right the (garble).
CAPCOM Roger.
SC That's relatively speaking, of course.
CAPCOM That's right.
CAPCOM Apollo 8, Houston.
SC This is Apollo 8.
CAPCOM Roger, Jim, we have you on the high gain antenna, we'd like to take the DSC and dump it over.
SC Roger. Houston, are you going to use our computer to update our state vector?
CAPCOM That's affirmative, Jim, we'd like to - stand by one and I'll tell you when to do it, put it in ACCEPT.
SC Roger. Then, I'll work my (garble) -
SC Roger. Then, I'll work my P52 around here, Houston.
CAPCOM Jim would you please put it in ACCEPT and we'll send you a P-27 and run a state vector update.
SC Roger, will do. ACCEPT.
CAPCOM Thank you.
SC Houston, this is Apollo 8, we have a little piece of useful information if you're interested in deliberating over it.
CAPCOM Go ahead.
SC Roger. Our first control point is very near the terminator, and as the objects we're tracking, I had an occasion to watch the Sun come up, and at about 2 minutes before sunrise you get the limb begins to brighten up into sort of a fine white haze, a faint glow completely over the space just behind the limb.
CAPCOM Roger, Jim -
CAPCOM Rog. I understand. About 2 minutes before the sun comes up, you get a fine white haze radiating out from behind the limb. How far out does it extend?
SC It goes up quite a ways. It takes a fan shape, unlike the sunrise on Earth where the atmosphere affects it. This is just sort of a complete haze all over the local area. It's concentrated at the exact time the sun comes up at ignition and then goes away from the sun spots. Very interesting.
CAPCOM (garble)
CAPCOM Can we go back to block with the computer.

APOLLO 8 MISSION COMMENTARY,12/24/68,GET 801512,CST 3:05p,257/3

SC Roger. Roger.
SC Okay, Mike, we're ready for the map update and then the TEI.
CAPCOM Okay, when you get your - before you get your map book out, the Houston Complex has got a little word for an old ex CAPCOM. They say they consider you in NON REMOTE. Over.
SC Not terminating me, I hope.
CAPCOM Okay, your map update. For rev 6 by 7, LOS 805724, sunrise 810657, prime meridan 811302. Are you with me?
SC You cut out after the prime meridian. I got it, but not AOS.
CAPCOM AOS 814305, sunset 821954, remarks IP1 PCA for B1 820739, and now I've got four more times for you which acquisition times for when various things come over the horizon. Over.
SC Roger. Go ahead.
CAPCOM Okay. Control point 1, acquisition time 810905, Control point 2, acquisition time 812148, Control point 3, acquisition time 814317, B1 acquisition time 820354. I'll say it again all those acq times are when they first come over the horizon. Over.
SC Roger. Copy Houston. In about 2 seconds I'll be ready for the TEI.
CAPCOM All right.
SC I'm ready.
CAPCOM CEI 7 SPS rising, G&N - stand by one, Bill.
SC Just a matter of general interest, Houston, everybody is feeling good and the CDR is taking a snooze.
CAPCOM All right, glad to hear it. We were just talking about a water dump down here. We've got one coming up and it looks like that on this rev prior to the time around LOS or just prior to LOS would be a convenient time to do it, do you think so?
SC Okay, we will. Down to 25 percent again?
CAPCOM That's affirmative and we'd also be interested in any comments, about what these various dumps have done to your optics if anything and how long the effects last after a dump.
SC Don't seem to have done anything to any optics, but it definitely got in some of the windows. There are a few little chunks of ice on window number 1, which is nearest the vent, and also on window number 5 a little bit, windows 2 and 4 remain amazingly clear.
CAPCOM Roger. Thank you Bill and I'm ready to resume the PAD when you are.
SC Okay, press all the way.

CAPCOM All right, weight 45701 minus 040 plus 157 083 18 2080 plus 32346 minus 01168 plus 05730. Are you with me so far on this?

CAPCOM Apollo 8, Houston, over.

SC Go ahead, Mike.

CAPCOM Rog. I got down through Delta V X, Y, and Z. Did you copy those? Over.

SC No I didn't read a word. I'm still waiting for the weight.

CAPCOM Roger. Let's go back to the weight. 45701 minus 040 plus 157. Are you with me? Over.

SC Sounds good.

CAPCOM Okay, GETI 083 18.

END OF TAPE.

CAPCOM Okay, GETI 083182080 plus 32346 minus 01168 plus 4 correction plus 05730 are you with me, over.

SPACECRAFT Roger

CAPCOM Thank you. 17 niner 00 niner 001 not applicable plus 0018732870 30732676 420880 253033 down 121 left 27 plus 07 niner 0 minus 16500 12 niner 7336238146 44 14 same North set Sirius and Rigel row 12 niner, pitch 155, yaw 010 4 quads for 15 seconds rising on the 2 degree mark at P ignition, over.

SPACECRAFT Roger. GETI 7 SPS/G&N 45701 minus 040 plus 157083182080 plus 32346 minus 01168 plus 05730 17 niner 9 correction 00 niner 001 NA, are you with me.

CAPCOM Yeah, I'm with you, Bill.

SPACECRAFT Plus 00187 32870 307 32676 32 correction 420880 253033 down 121 left 27 plus 07 niner 0 minus 16500 12 niner 73 36238 146 44 14 same North Set Sirius, Rigel 12 niner 155010 4 jet 15 seconds 2 degrees now horizon and peak.

CAPCOM That's all correct.

PAO Apollo Control Houston here 80 hours 36 minutes into the flight and I think we are going to have a little pause here perhaps for another 10 to 15 minutes before we come upon a final conversation then the spacecraft goes over the hill on this 6th rev around the Moon at orbits apogee 62.3 perigee 59.8 velocity 5,338 feet per second. At 80 hours 36 minutes this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control, Houston, at 80 hours 57 minutes. We're - we've just lost signal with the spacecraft We have several minutes of conversation to play out for you, but before we get to that I want to mention one or two things I don't think we've made mention of the fact today that we have finally after 6 revolutions gotten used to watching the spacecraft go from the right side of your front wall map to the left. Just as it is proceeding around the Moon in a retrograde orbit, this after all these years of watching spacecraft move from the left side of the wall map to the right, it's quite a transformation in just one brief day. Another point regarding the windows, obviously that this has to be the worst system we've turned up with on this flight, and we've been talking to several experts about it here. This particular condition that we're seeing, the fogging on the hatch window and on - to a considerable degree - and on windows one and five is similar to a condition that existed on Spacecraft 101 commonly known as Apollo 7. The situation has within very recent days been if not duplicated very closely approximated in test within the Spacecraft Industrial Government Complex. The test has shown that the material used in the window calking if you will, substance around the window that provides the trough in which the three pane windows ride. It has been demonstrated that some outgassing occurs, that the particular kind of rubbery material being used in these windows joints, that is the window joints in windows 1, 3, and 5. In the rendezvous windows 2 and 4, a different material treated under different conditions is being used and apparently it is quite successful. Some changes will be made on the next spacecraft. And that represents about all the information we have on that particular area. One other announcement, we presently plan no Press Conference this afternoon. I repeat no Press Conference at our change of shift because we really see no new information to offer. You've heard the bulk of the conversation today, and I think it's all been very straight forward. In view of the extraordinarily long hours that many of us have been in the Control Center, we would like to bypass the afternoon Press Conference which would have occurred about 6 o'clock. And continue to observe the activities through the evening hours and top off the evening with a Transearth Injection sometime around midnight, Houston time. So I say again, we presently plan no Press Conference at the change of this shift which will - would have occur about 6 p.m. tonight. We'll continue right ahead with as full a coverage as we can provide you, and will take care of any questions you might want to relay to our News Center. Here now is the tape that finished up the sixth rev.

CAPCOM Apollo 8, Houston, over.
SC Go ahead Houston.
CAPCOM Roger, you got your DSC back and you are GO for the next lunar orbit, over.
SC Roger, how far did you want us to dump that water?
CAPCOM 25 percent, please dump.
SC Roger, 25 percent. Houston, Apollo 8.
CAPCOM Apollo 8, this is Houston, over.
SC Are you receiving our tracking data?
CAPCOM That's affirmative, Jim. We are receiving.
SC Okay, thank you.
CAPCOM And also Jim, we are - that last P27 we sent was for the LM state vector only, and it will require a rev 47 enter to transfer to the CSM slot, over.
SC Roger, will do.
CAPCOM Thank you.
SC Okay, we're dumping the waste tank now, Houston.
CAPCOM Roger, Bill. Apollo 8, Houston, over.
SC Go ahead, Houston.
CAPCOM Roger, we've got four minutes till LOS, and everything is looking good down here.
SC Roger. How much longer do you think we have to go into battery charge there Mike.
CAPCOM I'll find out for you.
SC If you can wake up the E com, why don't you have ask the back room?
CAPCOM Oh, you really know how to hurt a guy. Apollo 8, Houston, we estimate the charge will be complete in another 45 minutes, over.
SC Okay, thank you very much.
CAPCOM Apollo 8, Houston, 1 minute til LOS, and standing by.
SC Okay, see you on the other side, Mike.
CAPCOM Looking forward to it.
SC Me too.

END OF TAPE

PAO Apollo Control Houston here 81 hours 43 minutes. We have not yet acquired nor have we put in a call but since it is about that time we thought we had better come up and let everyone know we are here. We have acquisition now and we are getting telemetry data. And apparently my call is going to wait a few minutes before he initiates the conversation. Here we go with the call. Let's bring it up.

SPACECRAFT Houston, Apollo 8.

CAPCOM Roger, Frank, good morning, you're loud and clear, how about me?

SPACECRAFT Loud and clear.

CAPCOM Welcome back.

SPACECRAFT Thank you

PAO This is Apollo Control. Let's see our cabin temperature, cabin pressure is 4.9. Cabin temperature 77 degrees and we apparently have the biomed switch on none of the pilots at this point. We're getting no data there. Here goes our call.

SPACECRAFT Go ahead, Houston.

CAPCOM Roger, we have a request that Jim space his marks, his 5 marks a bit more slowly if possible we would like to get a couple of them past the zenith. We're getting 5 of them with rather rapid spacing and from the geometry view point it would be better if you'd slow them down a little bit and lengthen them out so as to put a couple of them past the zenith, over.

SPACECRAFT ... Houston, Apollo 8, that last bit of marks are invalid. Disregard what Jim drew the last time.

CAPCOM Roger, understand the last bit of marks are invalid, over.

SPACECRAFT Roger, if you would correlate the last set.

CAPCOM We have an awful lot of background noise, Jim, could you say again please.

SPACECRAFT By just giving up on control voice 3 I tried to stick another control voice in between 2 and 3. It didn't do it so I just marked it down on the program.

CAPCOM All right, understand that you are coming up on 3.

PAO This is Apollo Control Houston. It sounds like another long quiet very much of a working pass. The 81 hours 51 minutes with Frank Borman up as you heard. He'll be very busy flying the spacecraft. Lovell continues doing program 222 Auto Optic Exercises. He has just a solid block one after another to do through this entire rev. Bill Anders is literally sandwiching in an eat period between additional land marks and more photography. Here is more conversation.

CAPCOM , of approximately 330 seconds between each mark. The last ones we are copying roughly 15 seconds between marks and we would like to stretch it out even further if that is okay with you.

SPACECRAFT All right.
PAO Ground Elapse Time 82 hours to 83 hours 10 minutes and hour and 10 minutes. Bill Anders will get a rest, a well deserved one. with all his lunch. At 81 hours 53 minutes this is Apollo Control Houston. We'll be back up with more action when it occurs.

END OF TAPE

PAO Apollo Control, Houston, 82 hours 13 minutes into the flight. And we are in the midst of one of our quieter passes today. We've had very little conversation. Here is what we've had in the last 10 or 15 minutes.

SC Houston, Apollo 8.

CAPCOM Apollo 8, Houston, over.

SC Roger, Mike. I find that tracking is much easier using the sextant than the scanning telescope. You have finer control and with this medium and resolve ..... the best combination.

CAPCOM Roger, Jim. I copy that it's easier for you to use the sextant than the scanning telescope. It gives you finer control and say again after that. Apollo 8, Houston, do you read?

SC Roger, that you copy.

CAPCOM Roger, I copy that it's - tracking is easier using the sextant than the scanning telescope because it gives you finer control and say again after that, over.

SC It has a combination of resolve and medium is perhaps the best combination of - combination of speed mode is too low, we can't catch up with the target.

CAPCOM Roger, understand that the best combination is resolve and medium. Low is just too low.

SC Roger. Houston, Apollo 8.

CAPCOM Apollo 8, Houston, over.

SC Roger, I'm not too sure what happened that time, Mike. I was marking on the landing sites, using the code, and I kept here in a large trunnion for auto optics. And I could see the target, or landing site was coming up, so I just went manually and marked and get the - the latitude and longitude were quite different from the nominal.

CAPCOM Roger, we copy that Jim.

PAO Apollo Control here. That brings us up to the live action. I can't really tell if this conversation will be extended or not. Mike Collins is doing a lot of note taking. Let's hold on for a minute or two and see. Each revolution around the Moon today, the crew has been given a GO approximately about 20 minutes before loss of signal. Right now we stand 38 minutes from loss of signal on this particular rev. About to pass the navigational updates to the crew. And here it goes.

SC Go ahead, Houston, Apollo 8.

CAPCOM Roger, we're checking into Jim's remarks on his P22, and in the mean time I have your maneuver pass and map updates at your convience, over.

SC Roger. Go ahead with your data, Mike.